

CLAIMS.

What is claimed is:

1. Method of sterilizing a packaging sheet material, comprising the steps of;
5 -applying hydrogen peroxide to a packaging sheet material, and;
-irradiating the packaging sheet material with light including at least one UV wavelength between about 200nm and 320nm,
characterized in that it comprises the intermediate step of removing the hydrogen peroxide from the surface of the packaging sheet material, while
10 retaining a residual or trace quantity at any microorganisms (30a), after the step of applying hydrogen peroxide and before the step of irradiating the packaging material, whereby said residual or trace quantity of hydrogen peroxide absorbed by or located adjacent to any microorganisms present on said packaging sheet material is directly targeted with UV radiation.
- 15 2. Method according to claim 1, **characterized in that** said step of applying hydrogen peroxide to said packaging sheet material comprises applying liquid hydrogen peroxide thereto at a concentration of up to 50% by weight.
3. Method according to claim 1, **characterized in that** said step of applying hydrogen peroxide to said packaging sheet material, comprises applying liquid
20 hydrogen peroxide at a concentration of from 20% by weight to 40% by weight.
- * 4. Method according to claim 1, 2 or 3, **characterized in that** said step of applying hydrogen peroxide to said packaging sheet material comprises the step of immersing said packaging sheet material in a hydrogen peroxide bath at a temperature comprised between 15 degrees Centigrade and 80 degrees
25 Centigrade, for a time interval of from 0.5 seconds to 2 seconds.
5. Method according to claim 1, **characterized in that** said intermediate step of removing excess hydrogen peroxide from said packaging sheet material comprises blowing a stream of heated air, heated to a temperature of from 80 degrees Centigrade to 150 degrees Centigrade onto said packaging
30 sheet material.
6. Method according to claim 1, **characterized in that** said step of irradiating the packaging sheet material with light including at least one UV

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wavelength, consists of irradiating said packaging sheet material with polychromatic UV light.

7. Method according to claim 1, **characterized in that** said step of irradiating the packaging sheet material with light including at least one UV wavelength, consists of irradiating said packaging sheet material with UV light at a wavelength of 222nm.

8. Method according to claim 7, **characterized in that** said step of irradiating the packaging sheet material with UV light at a wavelength of 222nm comprises irradiating said packaging sheet material with an excimer lamp.

9. Method according to ~~one or more of claims 1-8~~ ^{claim}, **characterized in that** said packaging sheet material is a web unwound from a roll.

10. Method according to ~~one or more of claims 1-8~~ ^{claim}, **characterized in that** said packaging sheet material is a blank.

11. Apparatus for sterilizing a packaging sheet material according to the method defined in claims 1-10, comprising;

- means for applying hydrogen peroxide to a packaging sheet material moving in an advancement direction,
- means for irradiating the packaging sheet material with light including at least one UV wavelength between 200nm and 320nm, arranged downstream of said
- means for applying hydrogen peroxide, with respect to said advancement direction, and;
- means for removing the hydrogen peroxide from the surface of the packaging sheet material,

characterized in that said means for removing the hydrogen peroxide from the surface of the packaging sheet material are interposed between said means for applying hydrogen peroxide and said means for irradiating the packaging material with light including at least one UV wavelength between 200nm and 320nm, ^{←→} whereby a residual or trace quantity of hydrogen peroxide absorbed by or located adjacent to any microorganisms present on said packaging sheet material is directly targeted with UV radiation.

12. Apparatus according to claim 11, **characterized in that** said means for applying hydrogen peroxide to said packaging sheet material comprise a bath containing liquid hydrogen peroxide at a concentration of up to 50% by weight.

< and in that said means for irradiating are arranged only downstream of the means for removing >

5 14. Apparatus according to claim 12 ~~or 13~~, characterized in that it comprises means for maintaining said hydrogen peroxide bath at a temperature comprised between 15 degrees Centigrade and 80 degrees Centigrade.

16. Apparatus according to claim 11, **characterized in that** said means for removing hydrogen peroxide from said packaging sheet material comprise at least one air knife for blowing air onto said packaging material sheet at a temperature of from 80 degrees Centigrade to 150 degrees Centigrade.

18. Apparatus according to claim 17, characterized in that said
20 monochromatic source of UV light comprises at least one excimer lamp.

19. Apparatus according to claim 11, characterized in that said means for irradiating the packaging sheet material with light including at least one UV wavelength, comprise a polychromatic UV lamp.